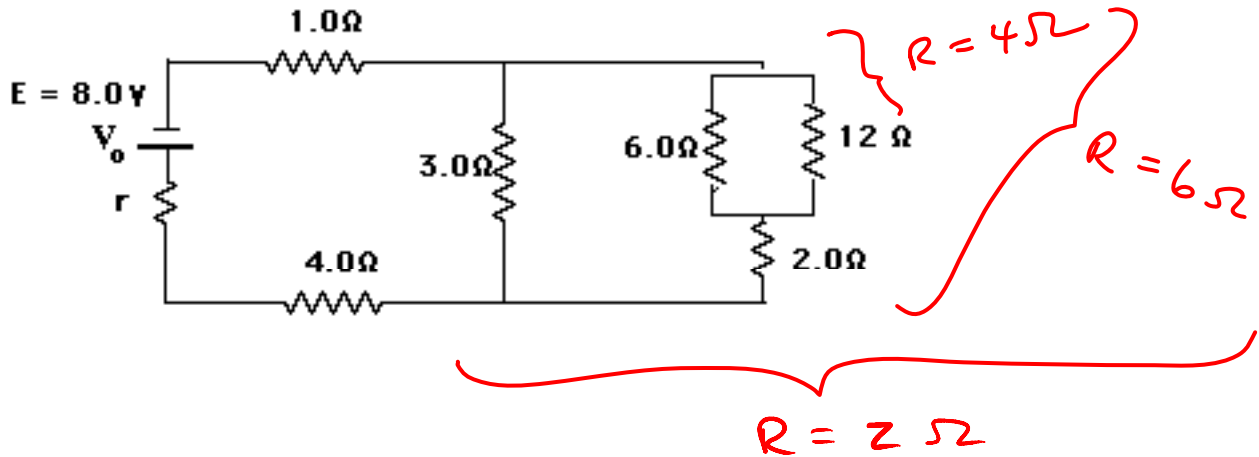


**Example #18:** A battery of EMF 8.0 V and internal resistance  $r = 1.0 \Omega$  is connected to an external circuit as shown. Find:

- the equivalent resistance of the circuit.
- the total current leaving the battery.
- the potential difference between the terminals of the battery.



a) using appropriate techniques to simplify,  
 $R_o = 1 + 2 + 4 = \boxed{7.0 \Omega}$

b) using  $V_T = E - Ir$  and  $V_T = IR_o$ ,

$$I = \frac{E}{R_o + r} = \frac{8.0}{7 + 1} = \boxed{1.0 \text{ A}}$$

c)  $V_T = IR_o = 1.0(7.0) = \boxed{7.0 \text{ V}}$